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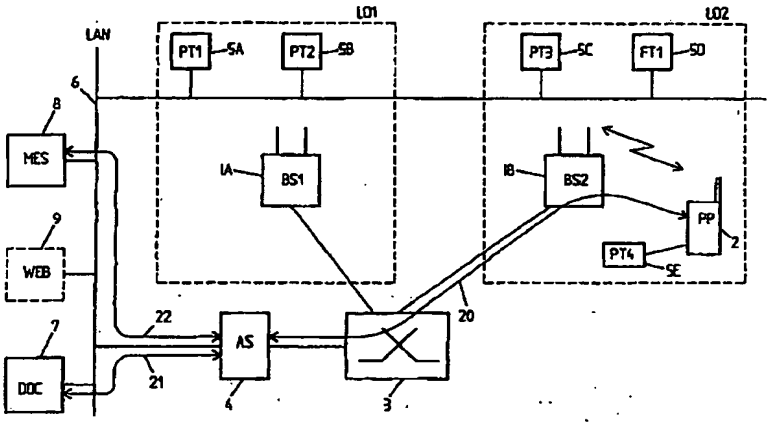

(57) Abstract

The present invention relates to a system and a method respectively for providing a hard copy of a document and/or an electronic message. The system comprises a number of terminals (5A, 5B, 5C, 5D, 5E) each having an identity, a network for connecting said terminals to at least one document and/or message handling means (7, 8, 9) and user access means (2). The user access means (2) comprises a mobile communication unit, e.g. a cordless telephone, of a communication system including a number of base stations (1A, 1B) and a number of switching arrangements (3). The system further comprises application serving means (4) including means for mapping or translation of the identity of a base station to which a communication unit is connected to a number of terminal identities giving terminals available to the particular base station (1A, 1B) so that a user can select which of the available terminals is to be used for providing a hard copy.

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Title:

SYSTEM AND METHOD RELATING TO HANDLING OF DOCUMENTS AND/OR MESSAGES

FIELD OF THE INVENTION

The present invention relates to a system and method respectively for providing a hard copy of a document and/or an electronic message. The system comprises a number of terminals, each with a given identity, a network connecting said terminals to document and/or message handling means and user access means. The invention also relates to application handling means for use in a system for providing a user with a hard copy of a document and/or an electronic message.

STATE OF THE ART

Today, a mobile user who wants to have a hard copy of a document, such as for example a document stored in a file server, an E-mail or an attachment to an E-mail, must use a PC. If the mobile user is away from his desk, he is obliged to find a printer, check the identity of the printer himself, activate a PC, select the printer on the PC, access a server from a PC to find the documents and order a print-out. It is obvious to everyone that this procedure can be inefficient, cost time and be cumbersome for the user. Also in other aspects it leaves much to desire.

SUMMARY OF THE INVENTION

What is needed is therefore a system and a method respectively which facilitates for a mobile user to obtain a hard copy of a

document or an E-mail or an attachment to an E-mail, a voice mail etc. Particularly a system and a method respectively is needed through which a user can obtain a hard copy of a document etc. without using a PC.

Application handling means are also needed through which the provision of a hard copy of a document or a message is facilitated for a mobile user, who for example is away from his desk.

Therefore a system as initially referred to is provided wherein the user access means comprises a mobile communication unit, such as a cellular telephone, a cordless telephone of a mobile or a cordless communication system or a hybrid telephone comprising a number of base stations and a number of switching arrangements. Application serving means are provided which includes means for mapping or translating a base station identity of a base station, to which a communication unit is connected, to a number of terminal identities so that the user can select which of a number of terminals that is to be used for the provsion of a hard copy of a selected document. Advantageously the terminals comprise a number of printers each of a given identity. Advantageously also a number of facsimile terminals each having a given identity are provided. Particularly the mobile communication unit, e.g. the cellular telephone, the cordless telephone or a hybrid telephone comprises menu handling means and means for text presentation and/or means for audio presentation. The application serving means particularly includes a table for mapping/translating a number of base station identities to terminal identities and/or means for translating base station identities to location identities corresponding to the terminal identities, for example room numbers or any other appropriate location identity easily recognizable to

the user. Advantageously a number of terminals, printers and/or facsimile terminals are given for each base station.

Advantageously the document handling means comprises storing means for storing documents and information about stored and/or available documents. Particuarly the document handling means comprises a document handling server. In an advantageous embodiment the document handling server includes functionality and intelligence to also store messages or message attachments. In an alternative embodiment separate message/media handling means are provided for storing of messages and converting text to facsimile. Particularly the messaging/media server comprises a unified messaging server for transferring a document as E-mail to an indicated facsimile terminal.

In a particular embodiment only a messaging/media server is provided, e.g. if the system only is used for providing hard copies of E-mails etc.

In still another embodiment the means for storing documents comprises a data base that can be accessed over a global data communication network such as for example Internet or an intranet.

The application serving means particulary includes processing means for retrieving and/or identification of documents and/or messages using document/message retrieval protocols and a communication unit-to-application serving means protocol. Via said processing means document handling means or message handling means are ordered to send a requested, i.e. selected, document/message to the indicated terminal. In a particular embodiment a portable printer is connected to the communication unit, e.g. a cordless

telephone, said portable printer forming an additional selectable option. In one embodiment an internal protocol is used for the communication between the application serving means and the communication unit, e.g. a portable part of the cordless telephony system. If a global data communication network such as Internet and WEB server technology is used for handling/storing documents/messages, the communication protocol between the application serving means and the communication unit is a HTTP protocol. Graphical presentation of documents/messages can then be provided on the display of the communication unit.

In one particular embodiment the application serving means includes means for segmentation of text into text messages for transfer via signalling in the control channel. If information/documents/ messages are transferred as data files, no segmentation is required in the application server.

In an advantageous embodiment the application serving means are connected to a switching arrangement, which application serving means and switching arrangement are arranged separately. In another embodiment the application serving means and the switching arrangement comprises a common unit such as a switching arrangement with extended application serving functionality, or, an application serving means including switching functionality. In a particular embodiment the application serving means and the switching arrangement comprises a mobility server e.g. as descbribed in WO 96/21330, 'System and method relating to cordless communication' which is incorporated herein by reference.

A method for obtaining a hard copy of a document or a message from one of a number of terminals each of which has a given identity

and each of which communicates with document and/or message handling means via a network, e.g. a local area network or a global data communications network, is provided. The method includes the steps of activating or selecting, from a telecommunication unit, e.g. a cordless telephone or a cellular telephone which is connected to a base station with a given location identity, an application for provision of document/message information, transferring the access request to application serving means keeping information about which terminals are selectable for a given base station, presenting the terminal options to the user, selection by the user of one of the terminals available for a particular base station identity, from the application serving means ordering the dcoument/message handling means to transfer the selected document/message to the selected terminal to provide a hard copy of the document/message.

In an advantageous embodiment the user is provided with information about documents/messages stored in handling means. The method then comprises the steps of using the information, e.g. an index or a table of contents, to select a document, a message or a part of a document or a message, presenting the available documents etc. to the user visually or audially, the user of the information selecting a document or a message etc. The application serving means is informed about the selection and a translation is performed between base station identification and terminal identifications. Then the result of the translation, i.e. the terminals available for a user connected to a particular base station, are presented to the user.

When the user has selected a terminal and this information has been transferred to the application serving means, the application

serving means orders the appropriate handling means to send the selected document to the selected terminal.

In an advantageous embodiment the control channel, or the signalling channel, is used for transfer of information between the application serving means and the telecommunication unit. Advantageously the application serving means then comprises means for segmentation of text into text messages for the purposes of transmitting information on a channel having a relatively limited bandwidth.

Segmentating means may also be provided for in the communication unit itself for displaying purposes irrespectively of whether a control channel with a limited bandwidth is used or if the information is transferred as a data file. The segmentation means in the portable part may be needed since the display has a limited size and only a limited amount of information can be shown at the same time. In an alternative embodiment the document/message handling means comprise databases accessible over a global data communication network. The method then includes a step of loading down information/documents etc. via a HTTP protocol provided between the application serving means and the telecommunication unit. The method advantageously also includes a step of presenting document/message information graphically on the display of the telecommunication unit.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will in the following be further described in a non-limiting way with reference to the accompanying drawings in which:

FIG 1 is a block diagram showing functional entities according to a first embodiment of the invention,

FIG 2 schematically illustrates a document/message access request step, a document/message retrieval step and a document/message presentation step for the embodiment of Fig 1,

FIG 3 schematically illustrates the step of presentation/ selection of optional terminals relating to the embodiment of Fig 1,

FIG 4 illustrates the step for providing a hard copy of a selected document from a selected terminal,

FIG 5 illustrates an alternative embodiment in which a document is forwarded to a facsimile terminal,

FIG 6 is a schematical block diagram of application serving means,

FIG 7 schematically illustrates a translation table provided in an application serving means,

FIG 8 schematically illustrates a first embodiment of a user interface comprising a displaying menu,

FIG 9 schematically illustrates an example of a display dialog,

FIG 10 schematically illustrates an alternative implementation of the present invention, and

FIG 11 is a schemtical flow diagram describing the use of a cordless telephone for selecting a terminal to provide a hard copy of a selected document/message.

DETAILED DESCRIPTION OF THE INVENTION

In Fig 1 a cordless communication system comprising a first base station BS1 1A and a second base station BS2 1B and a switching arrangement 3 is schematically illustrated. It should be clear that this is a very simplified system. The switching arrangement 3

is for example a private branch exchange PBX but only the functional entity is essential for the functioning of the present invention since cordless communication systems, e.g. DECT (Digital Enhanced Cordless Telecommunication) or similar are supposed to be known per se. The switching arrangement 3 is connected to application serving means 4 which in this embodiment comprises a separate application server. The application server AS 4 is connected via a local area network LAN 6 to document handling means 7 (DOC) which comprises a document handling server and to message handling means messaging/media server MES 8 which is a unified messaging server. LAN-connected are also a number of terminals, namely printing terminals PT1 5A, PT2 5B, PT3 5C and a facsimile terminal FT1 5D.

A portable printing terminal PT4 5E is also directly connected to the cordless telephone PP2. The cordless telephone 2 communicates with the application server 4 via base station 1B and switching arrangement 3 over a portable-to-server protocol 20 which in the illustrated embodiment for example is a simple internal protocol. A document retrieval protocol 21 is provided for the communication between the document handling server and the application server 4. Still further a message retrieval protocol 22 is provided for communication between the messaging/media server 8 and the application server 4. Fig 1 with a messaging server and a document handling server are illustrated to show that both alternatives are covered by the invention. Systems are of course also covered in which only E-mails, attachments etc. can be provided as a hard copy in which case only a messaging server is provided. Alternatively only a documents server is provided for the provision of documents in the form of hard copies.

LO 1 illustrates location 1 and indicates the terminals available for users connecting to BS1 1A, here PT1 5A and PT2 5B. Location LO 2 contains the terminals which are available for a user connected to BS2 1B, in this embodiment PT3 5C and FT1 5D. However, in this particular embodiment a portable printing terminal PT4 5E is directly connected to PP2 which constitutes an additional option for the user of PP 2. Decisive for whether this is an option or not only depends on whether the user has a portable printer or not (and if the portable telephone supports such an accessory). The cordless telephone PP2 is not shown in detail since a cordless telephone as such is supposed to be well known in the art. The cordless telephone 2 in a conventional manner comprises a display, keys and means for menu handling and text presentation. The switching arrangement 3 is a cordless switch, e.g. a PBX (or a radio exchange (REX)) including functionality for call control in a manner known per se. The radio access part, i.e. the cordless communication system, and the terminals for providing hard copies, document and message handling means constitute separate systems which are linked together by the application serving means 4. The document handling means or the document handling server 7 comprises a document storage for storing of documents and it also contains a table of contents relating to the stored documents. The messaging/media server 8 comprises a message storage and text-to-facsimile conversion means. The application server 4 comprises means for application control, means for translation of a base station identity, e.g. BS1, BS2, to a terminal identity, e.g. PT1, PT2, PT3, FT1 (and PT4) and in an advantageous embodiment also to the location identities of the concerned terminals. This will be further discussed above with reference to Figs 6 and 7.

The application server 4 also, in an advantageous embodiment, comprises means for segmentation of text into text messages, c.f. e.g. short message service (SMS), i.e. for providing text information on the display of the cordless communication unit PP2. The means for translation of a base station identity to a number of terminal identities etc. in an advantageous embodiment comprises a table which can be set-up, modified etc. from an external system; for example an operation and maintenance system or any other external system.

It should be clear, however, that Fig 1 merely is a schematical example of an embodiment. According to the invention one or more printing terminals can be associated to one base station or to more than one base station. One or more facsimile terminals can also be associated to one base station, the same facsimile terminals can be associated to more than one base station, etc. Alternatively only one printer or one facsimile terminal or any number of each there of can be associated to a number of base stations etc. Of course there also does not have to be provided any portable printers; this merely relates to one particular embodiment. In one embodiment there are no facsimile terminals and there is no option for providing a hard copy on a facsimile terminal. Alternatively there are only facsimile terminals.

Thus, if the user of PP2 for example wants a print-out of a document or an E-mail, the user accesses his telecommunication system and orders access to an application enabling the provision of hard copies. The cordless user, or the mobile user, since the inventive concept also covers the case in which a cellular communication system and a cellular telephone (or a hybrid telephone) is used, which for example may be particularly

interesting in an office environment in which so called pico cells are used. The mobile user is guided by display messages or voice messages provided on the telecommunication unit and the user selects from the presented alternatives which type of document he wants and the identity of the document. Of course a user may order only a part, i.e. any part, of a document to be provided in form of a hard copy. The position of the user is given by the identity of the base station 1B to which he connects, i.e. that is engaged in the call. In the application server 4 the base station identity is translated into one or more terminal identities and/or location identities indicating the available terminals. The alternatives, terminal identities and/or location identities, are presented to the mobile user on the communication unit display (or as a voice message) and the user can then select the most convenient terminal from his mobile communication unit, in this particular case a cordless telephone PP2. If a document and a printer have been selected, the document is sent from the document server to the selected printer. If a facsimile terminal is selected, the document is transferred as an E-mail via a unified messaging/media server MES 8 to the selected facsimile terminal (in this particular embodiment). If the user wants a hard copy of a message, e.g. an E-mail, an attachment to an E-mail or a voice mail, the procedure is the same with the only difference that the messaging server is used instead of the document server. In an advantageous embodiment a WEB-server (indicated with dashed lines in Fig 1) is also alternatively provided.

In Fig 2, which is a block diagram similar to that of Fig 1, some procedural steps are indicated. Using the portable-to-server protocol a document/message access request 20A is sent from the cordless telephone 2 to the application server 4. The application

server 4 then retrieves document information from document handling server 7 and/or messaging/media server 8 using the document retrieval protocol or the message retrieval protocol respectively 21A, 22A. Advantageously a list of available documents/messages is retrieved. The list of available documents is then presented to the user on the display of the cordless telephone (or as audio information) so that the user can indicate a specific document or a specific part of a document etc.

Although mainly referring to documents in the detailed description to follow, it should be clear that the invention similarly applies to the provision of hard copies of messages or message attachments. The functioning is similar in both cases as referred to above.

In one embodiment the signalling channel is used and document segmentation is then provided for in the application server. Segmentation can also be provided for in the cordless telephone for displaying purposes. It is automatically done or provided for by the user via means for user interaction (e.g. scrolling). Using the portable-to-server protocol, document information, 20B, is then provided to the cordless telephone 2, 20B, e.g. a table of content. If (not shown in Fig 2) a portable printer is connected to the cordless telephone 2, and the user selects this option, this may be indicated to the application server which thus orders sending of the document to the portable printer. This, however, only relates to one way of ordering a print-out on a portable printer connected to the cordless telephone. According to the invention, document presentation on the cordless telephone relates to an advantageous embodiment which however not is necessary for a basic functionality. Basically it is only required that a

document/message is pointed out in one way or another. For example, if the reception of a fax or an E-mail is indicated to the user, the user in an advantageous embodiment indicates that he wants a hard copy of that (a selected) fax or E-mail etc. and selects a terminal.

Fig 3 illustrates the situation when a document has been selected or pointed out in any convenient manner, and the application server has been provided with information about the base station identity, in this particular case BS2, and a translation from base station identity to terminal identity (location identity) is performed in the application serving means 4 (which will be further described with reference to Fig 6). The optional terminals, here PT3 and FT1 (and in an alternative embodiment also PT4) are then presented to the user of the cordless telephone 2, 20C, again using the portable to server protocol, (this relates to the 4th selection of Fig 9 according to an advantageous embodiment). From PP2 information about which terminal has been selected is transferred to AS 4, 20D.

Fig 4 illustrates the steps leading to a print-out of a selected document. When the application server 4 has received information about the selected terminal from PP2, the application server 4 sends an order, 21E, to the document handling server DOC 7 (in this case) to send the selected document to the selected terminal, in this particular case PT3 5C. DOC 7 then sends the selected document to the selected printer PT3, 25F. In an advantageous embodiment the application server only triggers the print-out when a selection has been done and the document handling server operates directly towards the local area network and the application server is not involved anymore. However, this can also

be provided for in other ways, for example the application server may provide for sending of the document/message to the selected terminal and order it to print-out the document/message etc.

In Fig 5, which is an alternative to the embodiment as illustrated with reference of Fig 4, a facsimile terminal FT1 5D is selected. The application server 4 orders, 21E', the document handling server 7 to send the selected document to facsimile terminal FT1 5D. The document handling server then, according to one embodiment, sends an E-mail, 25F', to the unified messaging server MES 8, which in turn converts the E-mail to a facsimile file and sends it to the facsimile terminal 5D, 25G'.

In alternative embodiment an intelligent document handling server includes functionality for conversion and forwarding of a selected document to a facsimile terminal without needing any unified messaging media server.

In Fig 6 application server 4 of Figs 1-5 is illustrated.

The application serving means AS 4 comprises first protocol handling means 41 for handling the application layer protocol, or an end-to-end protocol server processor to portable part, e.g. OSI (Open System Interconnection) layer 7 and second protocol handling means 42 handling a network layer protocol, e.g. OSI layer 3. The DECT standard, c.f. ETS 300 175 (Part 1-8), "Radio Equipment and Systems (RES); Digital Enchanced (formerly European) Cordless Telecommunications (DECT) Common Interface (CI) Standard." only covers the lower three layers of the OSI-model. These are redefined into four layers and a management entity. Layer 7

information (as any information above layer 3) is transported transparently through the DECT-radio connection, i.e. end-to-end.

The application server 4 also comprises third protocol handling means 45 handling the message/document retrieval protocols, i.e. the communication with the LAN. When an access request is received in AS4 over ISDN, the identity of the base station, to which the portable part is connected, is transferred over the network layer protocol and handled in the second interfacing means 42. Through a pointer the base station identity is indicated to the translating means 43 comprising a table which keeps information about which terminals that are available for each base station, i.e. here terminals PT1, PT2 are available for BS1 wheras PT3 and FT1 are available for communication units connected to BS2. In this particular case, for example, BS2 is the base station to which the portable part (see Fig 1) is connected. This means that a user can select between PT3 and FT1. It should be clear that the translating means, or the table, 43 shown in Fig 6 is simplified and generally a translation of base station identify is not only done to a terminal identity but also to a location identity describing the location of the respective terminal, which information mostly is easier to interprete for a user since it for example relates to a room number or anything else that is easy recognizable by the user.

The translating means 43 communicates with logic control and processing means 44 which in turn communicates with the first and the second protocol handling means 41, 42 respectively. Intermediate storing means (not shown) can be provided to temporarily store the information obtained from the translating means. Advantageously the translating means 43, i.e. the table,

can be manipulated externally for example via an operation and maintenance system or anything else which means that identities, terminal identities, base station identites and location identities can be added, removed, changed etc. However, this can be provided for in any convenient manner.

In an advantageous embodiment AS 4 comprises segmentation means for segmentation of a document/message if a user requests the document/message to be shown on the portable part and if the signalling channel is used; c.f. the short message service (SMS) of cellular communication systems ETSI Technical Report ETR 015, March, 1991 mentions that DECT has protocols for paging and broadcasting in a Data-Link Control Layer and supports SMS in a Network Layer. If larger amounts of information are to be displayed, a data channel (information channel) is advantageously used instead of the control channel which has a smaller bandwidth.

In an alternative embodiment segmentation means are merely provided for in the portable part, e.g. if databases accessible by a global data communications network are used, e.g. Internet. Then, however, segmentation is not needed for transportation purposes but is only used for displaying.

The procedural steps have been described with reference to Figs 2-5 and when a user has selected a terminal, the logic control and processing means 44 sends an order via the interfacing means 45 to the relevant document server/messaging server instructing it to send the selected document (message) to the selected terminal. Advantageously the document server or the messaging server, as the case may be, operates directly towards the local area network and the application server 4 is not involved after having ordered the

sending of a document (or a message) to a printer terminal or a facsimile terminal.

In an alternative embodiment the global data communications network can be used as document/message handling means, e.g. Internet. The portable to server protocol is then a HTTP-protocol and the information can be downloaded and presented graphically and/or as text on the portable part.

In an advantageous embodiment document information is transferred to a portable part using control channel signalling (or the A-field as standardized in ETSI ETS 300175, Part 1-8).

According to one embodiment selections are performed using scrolling as described with reference to Fig 8.

In Fig 7 an alternative table for translating base station identity to terminal identity and location identity is schematically illustrated. The embodiment as such is not illustrated in any figure since Fig 7 merely intends to illustrate that a terminal identity also corresponds to a location identity which, as referred to in Fig 6, normally is of more value to a user. The table 43_1 relates to a case in which there are three base stations, namely BS10, BS20 and BS30. The terminal options for a communication unit connected to BS10 are printers PT10 and PT20 respectively.

For BS20 there are four options, namely PT10 (which is also was an option for a communication unit connected to BS10), PT30, PT40 and facsimile terminal FT10. The corresonding room numbers are 501,

503, 504 and 504. Thus PT40 and FT10 are both in one and the same room in this case.

For a communication unit connected to BS30, there are also three alternatives, namely PT50, FT20, FT30 having the corresponding location identies, e.g. room numbers, 505, 505, 506. Terminals connected to the communication units, particularly the portable parts, themselves can be provided as alternatives in the translating means which is an alternative embodiment to what is discussed in the flow diagram of Fig 11 below in which case printing means connected to the communication units are not included as options in the translating means but rather as a selection that can be done on the communication unit before any translation between base station identity and optional terminals is performed. In that case, if a printer connected to a communication unit is selected, no translation has to be done.

The invention is however not limited to the provision of any terminals connected to the communication units but this merely refers to advantageous embodiments. The case may also be that there are no terminals available for a particular base station, in which case the user is restricted to use a terminal connected to his own communication unit.

In Fig 8 the principle of scrolling on a display menu of a communication unit is illustrated. Indicating means provided in an appropriate manner, fixed keys, soft-keys etc. are used to scroll up/down in the list of options. It is here supposed that in the first selection, option 3 is selected by affirmation or for example by pressing the yes-key or through any other appropriate means. The menu then switches to a second selection in which there

are three options. If in this case the second option is selected, e.g. by pressing yes, a third selection menu is shown, for example comprising two options. In this case it is supposed that the user selects the second option.

Fig 9 shows an implementation of an optional display dialogue. In a first selection, e.g. giving different applications, the user can select between option 1, option 2, retrieve document, retrieve message, option 5 and option 6. (Options 1,2,5 and 6 are not exemplified herein, since they are not relevant, but in principle may refer to any application.) It is here supposed that the user selects to retrieve a document. In the second selection a number of documents id's are presented. The user here selects the document having the identity 3.

As a third selection, the user can select between displaying the document on the display, printing of the document on a printing terminal available to a communication unit connected to a given base station or to request a print out on printer connected to the communication unit, e.g. PP1. In this case however it is supposed that the user selects option print. In the forth selection the available printer identities, here printer id1, id2, id3, id4 in rooms 1, 2, 3 and 4 respectively are presented. If the user selects printer id3 in room id3, the selected document is printed on printer id3 in room id3. In an alternative embodiment the options are presented graphically on the display.

In Fig 10 an alternative embodiment is illustrated in which the application serving means include the additional functionality as provided for by the switching arrangement 3 as illustrated in Fig 1. (Or a switching arrangement is provided which includes the

additional functionality of an application server.) Two base stations 10A, 10B are connected to the application serving switching means ASX 40. Connecting to each BS10A, 10B respectively, portable parts 20A, 20B respectively are illustrated. ASX 40 is connected to a LAN 60 connecting printer terminals 50A, 50C, facsimile terminals 50B, 50D and a document messaging server DOC MSG 70. A universal information server 70 includes intelligence to handle documents as well as messages and includes document, messaging and web server functionality. As in the preceding embodiments an application server-to-portable part protocol 220 is provided enabling communication between the application server via, in this case, a base station 10A and the extended application server ASX 40. A document/message retriever protocol 210 is provided for communication between the document message handling server 70 and the extended application server 40.

In other aspects the extended applcation serving means 40 includes the same functionality as the application server 4 as described with reference to Figs 1-5 and translating means are provided in which is provided for translation of BS ID 10A to the terminals within location LO10, i.e. printer terminals 50A, 50C and facsimile terminal 50B and correspondingly the terminals available to the BS 10B are printer terminal 50C and facsimile terminal 50D within location LO20. As can be seen PT 50C is available both for PP 20A connected to BS 10A and PP 20B connecting to BS 10B. Supposing that the user of PP 20A has selected FT 50B, eventually including the steps of showing the document/message on the terminal etc., ASX 40 orders document/messaging handling means 70 to send the message to FT 50B, 250.

Fig 11 shows one example of a flow when a user of a cordless telephone PP wants to have a hard copy of a document or a message. The user then activates PP which connects to a BS in a manner known per se, 101. Using a menu the user selects the desired application, i.e. in this case a document/message information access request is provided to the application server AS. The identity of the base station BS ID is included in the access request, 102. AS then retrieves information about available documents and/or messages from the relevant server, e.g. a document server and/or a messaging/media server, 103.

Using the document/message retrieval protocol, a list of available documents/messages is transferred from AS to PP using the application server-to-portable part protocol, 104. In a further selection step, the user then selects a document or a message on PP, 105, and via the application server-to-portable part protocol, information is transferred from PP to AS about which is the selected document/message, 106.

In AS translating means provides the terminal identities/location identities corresponding to the given base station identity (BS ID), 107, and the user is presented with an option to have the document/message presented visually (or as audio information) by PP, 108. If the user selects to be furnished with a document/message presentation on/by the portable part, a segmentation is performed in AS, 108A signalling is used as discussed earlier. The selected document/message is then shown in a convenient manner on PP, 108B. After that, or if the user has selected not to be furnished with a presentation on the portable part, the alternative 'hard copy' can be selected on the display, 109. Alternatively this option may be presented in audio form.

Exactly how the presentation is done, how the options are presented etc. is not important, relevant is only that various options are presented which can be selected or not. If a user indicates that no hard copy is needed, a further alternative may be the selection of a new document/message and the user is asked whether a new document/message is wanted, 108C. If yes, the procedure restarts from selection of document etc., 105, as described above. If, however the user is not interested in being presented any other message or document, he indicates 'no' and the application is ended, 108D. If however the user indicates that a hard copy is needed, AS provides PP within information about which are the terminal options, 111. Among the terminal options, the user selects a particular terminal, a printer terminal or a facsimile terminal, 111. Information about which terminal has been selected is then transferred to AS using the application server-to-cordless protocol, 112. The application server then orders the relevant server, i.e. the document handling means or the message/media handling means, as the case may be, to send a document (or a message) to the selected terminal. The document or the message is then provided as a hard copy, 113.

The invention is not limited to the shown embodiments, but can be varied in a number of ways without departing from the scope of the claims. It is applicable for cordless as well as cellular communication systems. Presentation of information, options etc. can be provided for in different ways and forms and different levels of options can also be provided, e.g. corresponding to a narrow scope only giving the closest terminals or terminals within a given area of terminals available within a larger area etc.

Furthermore the appropriate security and access control is provided for in any convenient manner. Still further more than one document and/or message can be selected in one and the same operation.

CLAIMS

1. A system for providing a hard copy of a document and/or an electronic message, said system comprising a number of terminals (5A,5B,5C,5D,5E;50A,50B,50C,50D), each having an identity, a network (6;60) for connecting said terminals to at least one document and/or message handling means (7,8,9;70), and user access means (2;20A,20B),
c h a r a c t e r i z e d i n
that said user access means comprises a mobile e.g. cordless or cellular communication unit (2;20A,20B) of a mobile e.g. cordless or cellular communication system comprising a number of base stations (1A,1B;10A,10B) and a number of switching arrangements (3;40), and in that the system comprises application serving means (4;40), wherein said application means (4;40) comprises means ($43,43_1$) for mapping/translating a base station identity to which a communication unit is connected, to a number of terminal identities relating to terminals available to the particular base station, so that the user can select which, of the number of available terminals, that is to be used for providing a hard copy.

2. A system according claim 1,
c h a r a c t e r i z e d i n
that the terminals comprise a number of printers (5A,5B,5C,5E;50A,50C), each having a given identity.

3. A system according to claim 1 or 2,
c h a r a c t e r i z e d i n

that a number of the terminals are facsimile terminals (5D;50B,50D) each having a given identity.

4. A system according to any one of the preceding claims, characterized in that the user access means comprises a cordless telephone (2;20A,20B).

5. A system according to any one of the preceding claims, characterized in that the mobile communication unit comprises menu handling means and means for text presentation.

6. A system according to any one of the preceding claims, characterized in that the application serving means (4;40) comprises a table ($43;43_1$) mapping/translating a number of base station identities to terminal identities and/or means for translating base station identities to location identities corresponding to the terminal identities, such as for example room numbers or similar.

7. A system according to claim 6, characterized in that for each base station (1A,1B;10A,10B) a number of terminals, printers or facsimile terminals, are given.

8. A system according to anyone of the preceding claims, characterized in that the document and or message handling means (7,8,9;70) comprises storing means for storing of documents and information about stored and/or available documents/messages.

9. A system according to claim 8,
characterized in
that the application serving means (4;40) comprises processing means (44) for retrieving and/or identification of documents and/or messages using document/message retrieval protocols and a communication unit-to-application serving means-protocol and in that via said processing means document handling means or message handling means are ordered to send the requested document or message to the indicated terminal.

10. A system according to any one of the preceding claims,
characterized in
that a terminal is provided which comprises a portable printer (54) connected to the communication unit (2), e.g. the cordless telephone, and in that said portable printer (5E) constitutes an additional selectable option.

11. A system according to any one of the preceding claims,
characterized in
that an internal protocol is used for the communication between the application serving means (4;40) and the communication unit, e.g. the cordless telephone.

12. A system according to one of claims 1-10,
characterized in
that the network comprises a global data communication network, e.g. Internet, and in that databases accessible over said network provide the document/messaging handling functionality and in that the communication protocol between the application serving means and the communication unit, e.g. the portable

telephone, is a HTTP protocol and in that advantageously graphical presentation of documents/messages is provided on the communication unit.

13. A system according to claim 11, characterized in that the application serving means (4;40) comprises means for segmentation of text into text messages for transfer to the communication unit as signalling over the control channel of the communication system.

14. A system according to any one of the preceding claims, characterized in that the application serving means (4) and the switching arrangement (3) are arranged separately.

15. A system according to any one of claims 1-13, characterized in that the application serving means and the switching arrangement are provided as a common entity (40), such as for example a mobility server.

16. A system according to any one of the preceding claims, characterized in that separate messaging/media handling means (81) is provided for storing and handling of messages.

17. A method for obtaining a hard copy of a document or a message from one of a number of terminals (5A,5B,5C,5D,5E; 50A,50B,50C,50D), each having a given identity and communicating

with document and/or message handling means (7,8,9;70) via a network (6;60), e.g. a local area network,
c h a r a c t e r i z e d i n
that it comprises the steps of:

- requesting document/message access from a telecommunication unit (2;20A,20B), e.g. a cordless telephone, connected to a base station having a given location identity,
- transferring the access request via said base station (1A,1B;10A,10B), including the base station identity, to application serving means (4;40) storing information about available terminals selectable for each base station,
- selecting one of the terminals included in an option for the particular base station identity,
- sending the document/message to the selected terminal to provide a hard copy of the document/message.

18. A method according to claim 17,
c h a r a c t e r i z e d i n
that the information comprises information about documents/ messages stored in handling means (7,8,9;70) and in that the method comprises the steps of:

- providing said information to a user for selecting a document, a message or a part of a document or a message,
- retrieving the selected document/message/part of message or document,
- presenting the available optional terminals to the user on communication unit display means.

19. A method according to claim 17 or 18,
c h a r a c t e r i z e d i n
that it comprises the step of:

- ordering from the application serving means (4;40) the appropriate handling means (7,8,9;70) to send the selected document to the selected terminal.

20. A method according to any one of claims 17-19, characterized in that it comprises the steps of:
- in the application serving means (4;40) segmentating text into text messages for transfer via signalling,
- presenting said text messages to the user on a display of the telecommunication unit before a document/message etc. is requested.

21. A method according to any one of claims 17-19, characterized in that message/document information is stored in databases of a global datacommunications network and in that it comprises the steps of:
- loading down information/documents via a HTTP protocol provided between the telecommunication unit and the application serving means,
- graphically presenting information on the telecommunication unit.

22. A method according to any one of claims 17-21, characterized in that the terminals comprise a number of printers and/or a number of facsimile terminals.

23. A method according to claim 22, characterized in

that a separate message handling means (8) is provided for storing of messages and for text to facsimile conversion and in that a document access request is provided from document handling means (7) to said message handling means (8) through the sending of an E-mail from the document handling means (7) to the message handling means (8) and delivering to a facsimile terminal.

24. A method according to any one of claims 17-23, characterized in that an optional terminal comprises a portable printer (5E) connected to the telecommunication unit.

25. Application serving means for providing hard copies of documents and/or messages, characterized in that said application serving means links a mobile communication system comprising a number of communication units and a number of base stations with a network, said network interconnecting means for storing information, e.g. documents and/or messages with a number of terminals for providing of hard copies, said application serving means including translating means for translating a base station identity to a number of terminal and/or location identities of terminals available for a communication unit connected to said base station, and processing means for communication between the mobile communication system and the interconnecting network.

26. Application serving means according to claim 25, characterized in

that the application serving means additionally includes switching functionality.

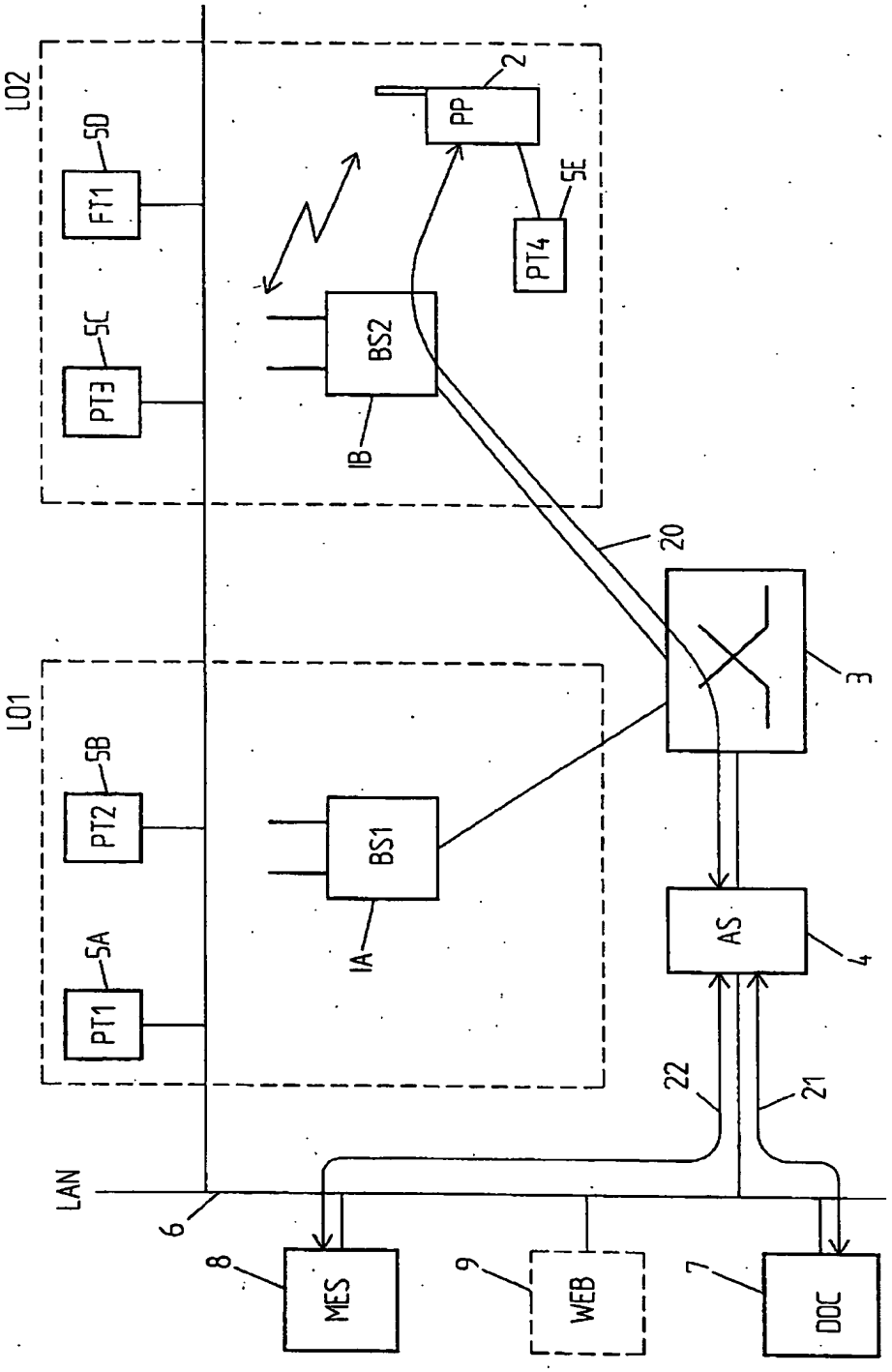

LO2
LO1
PP
2
5D
FT1
5C
PT3
5E
PT4
BS2
IB
20
3
5B
PT2
BS1
IA
5A
PT1
AS
4
22
21
LAN
6
8
MES
9
WEB
7
DOC

FIG. 1

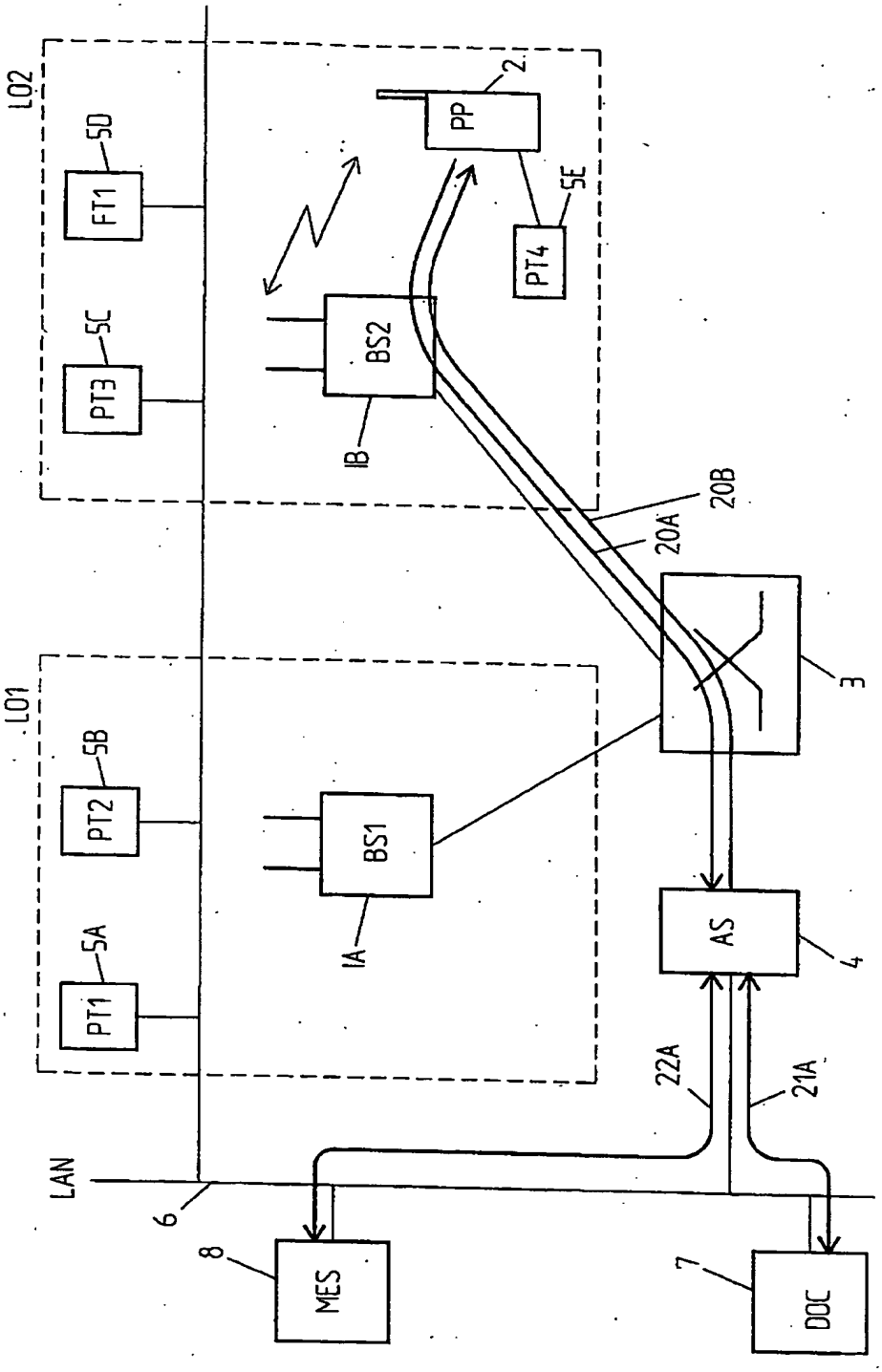

LO2
LO1
PP
2
5D
FT1
5C
PT3
BS2
IB
PT4
5E
20B
20A
3
5B
PT2
BS1
IA
5A
PT1
AS
4
22A
21A
LAN
6
8
MES
7
DOC

FIG.2

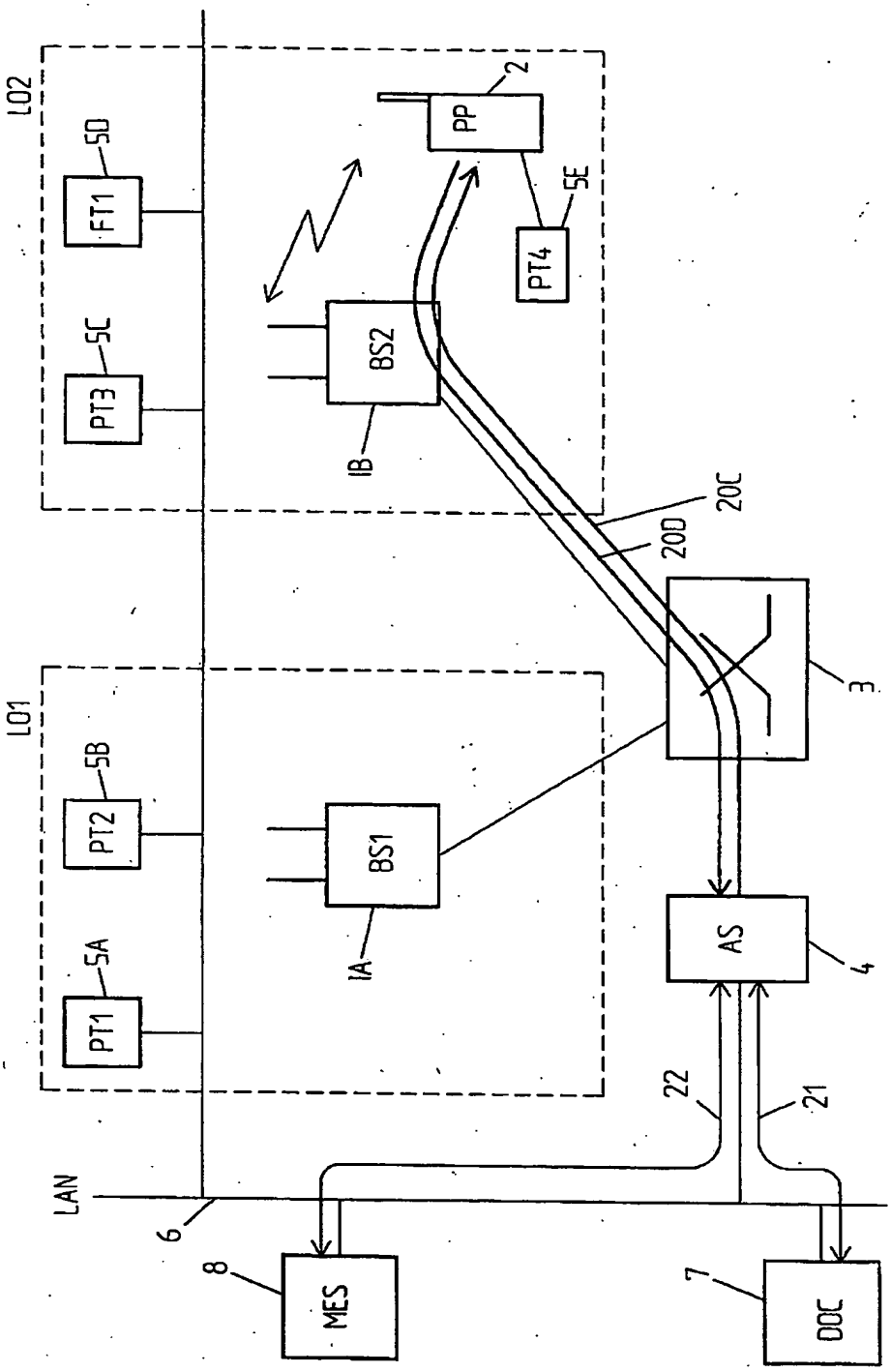

LO2
LO1
PP
2
5D
FT1
5C
PT3
5E
PT4
BS2
IB
20C
20D
3
5B
PT2
BS1
IA
5A
PT1
AS
4
22
21
LAN
6
8
MES
7
DOC

FIG.3

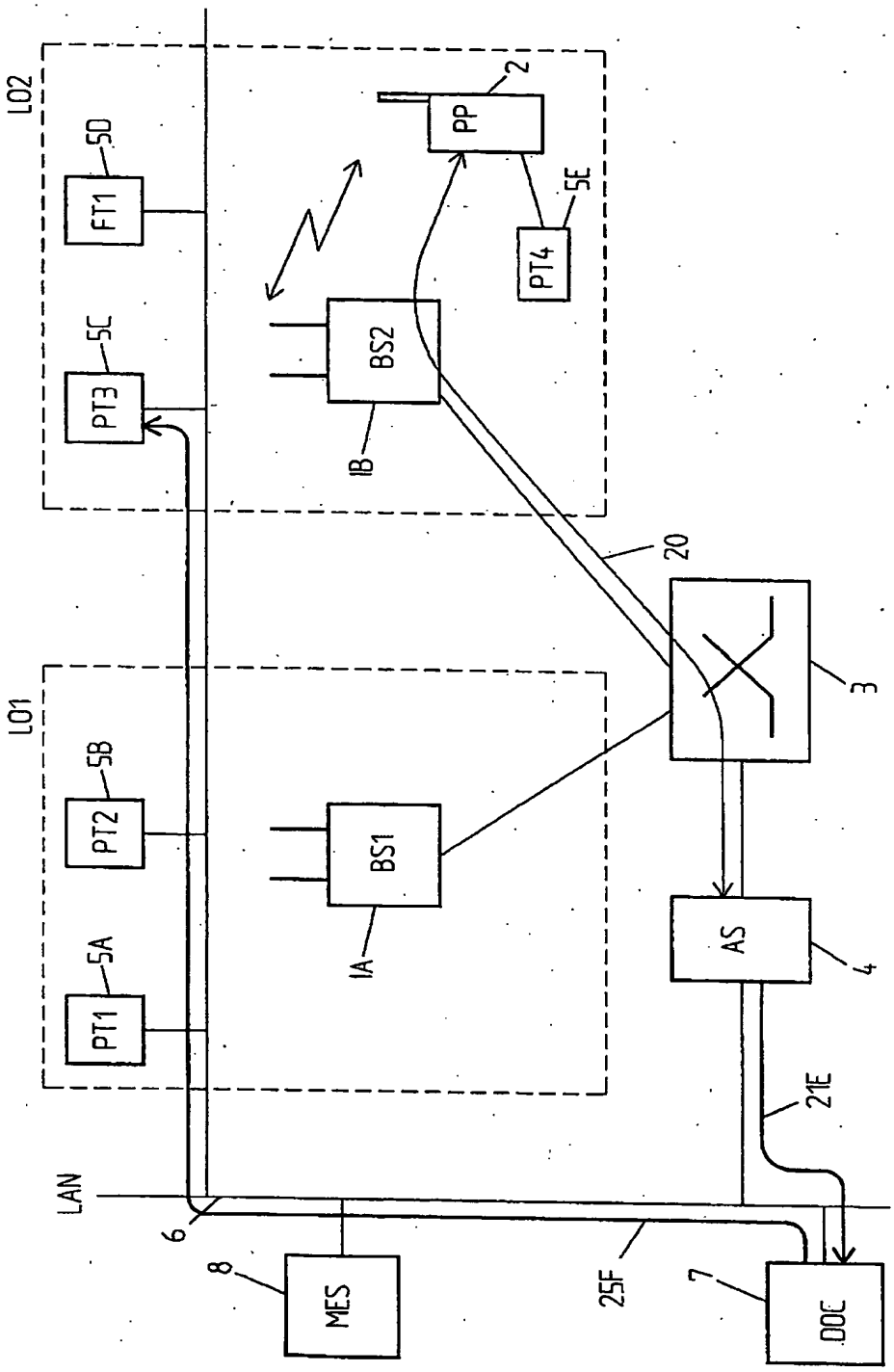

LO2
LO1
FT1
5D
PT3
5C
PT2
5B
PT1
5A
PP
2
PT4
5E
BS2
1B
BS1
1A
20
3
AS
4
21E
LAN
6
8
MES
25F
7
DOC

FIG. 4

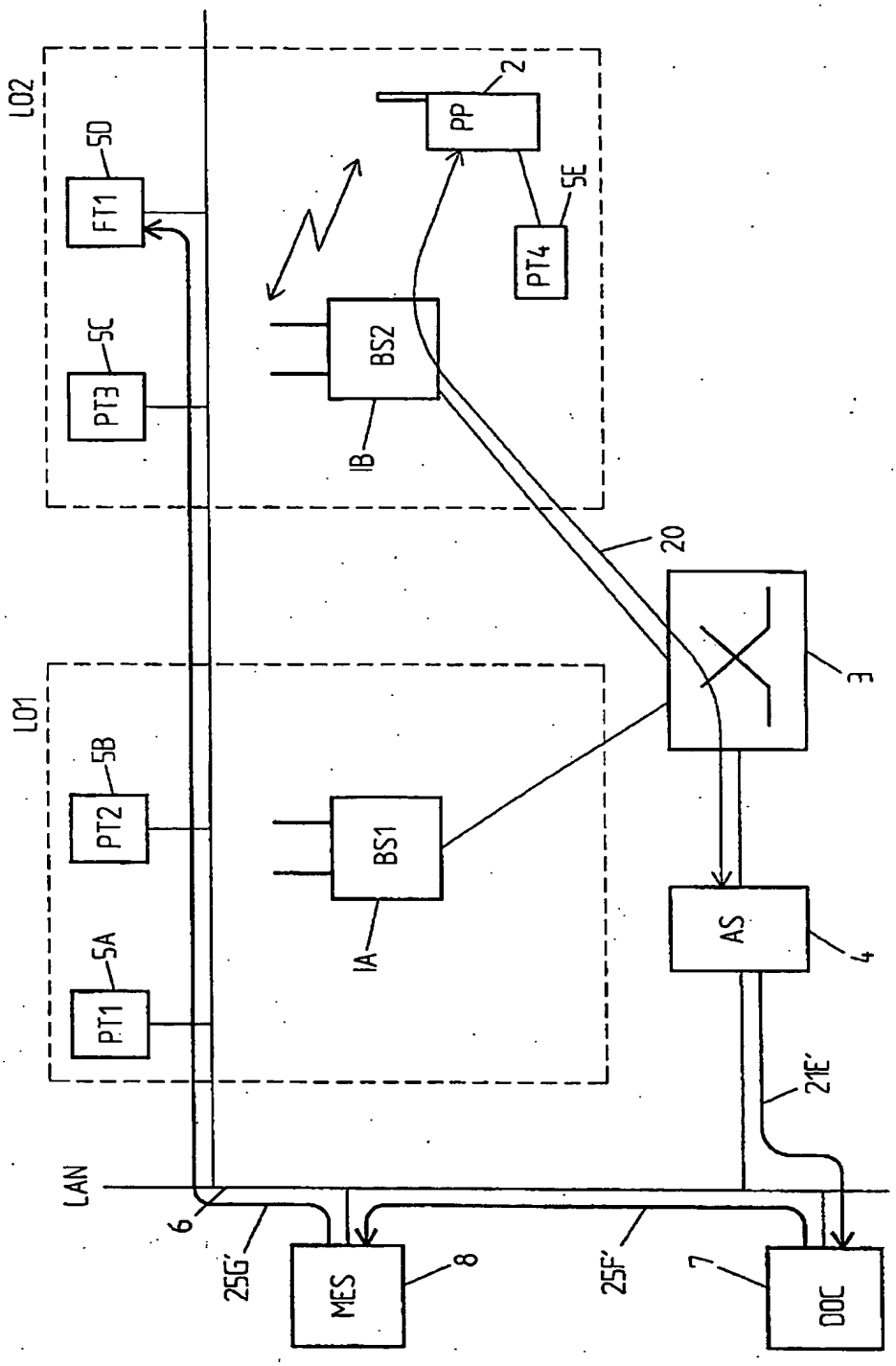

LO2
LO1
PP
2
5D
FT1
5E
PT4
5C
PT3
BS2
IB
20
3
5B
PT2
BS1
IA
5A
PT1
AS
4
21E'
LAN
6
25G'
MES
8
25F'
7
DOC

FIG.5

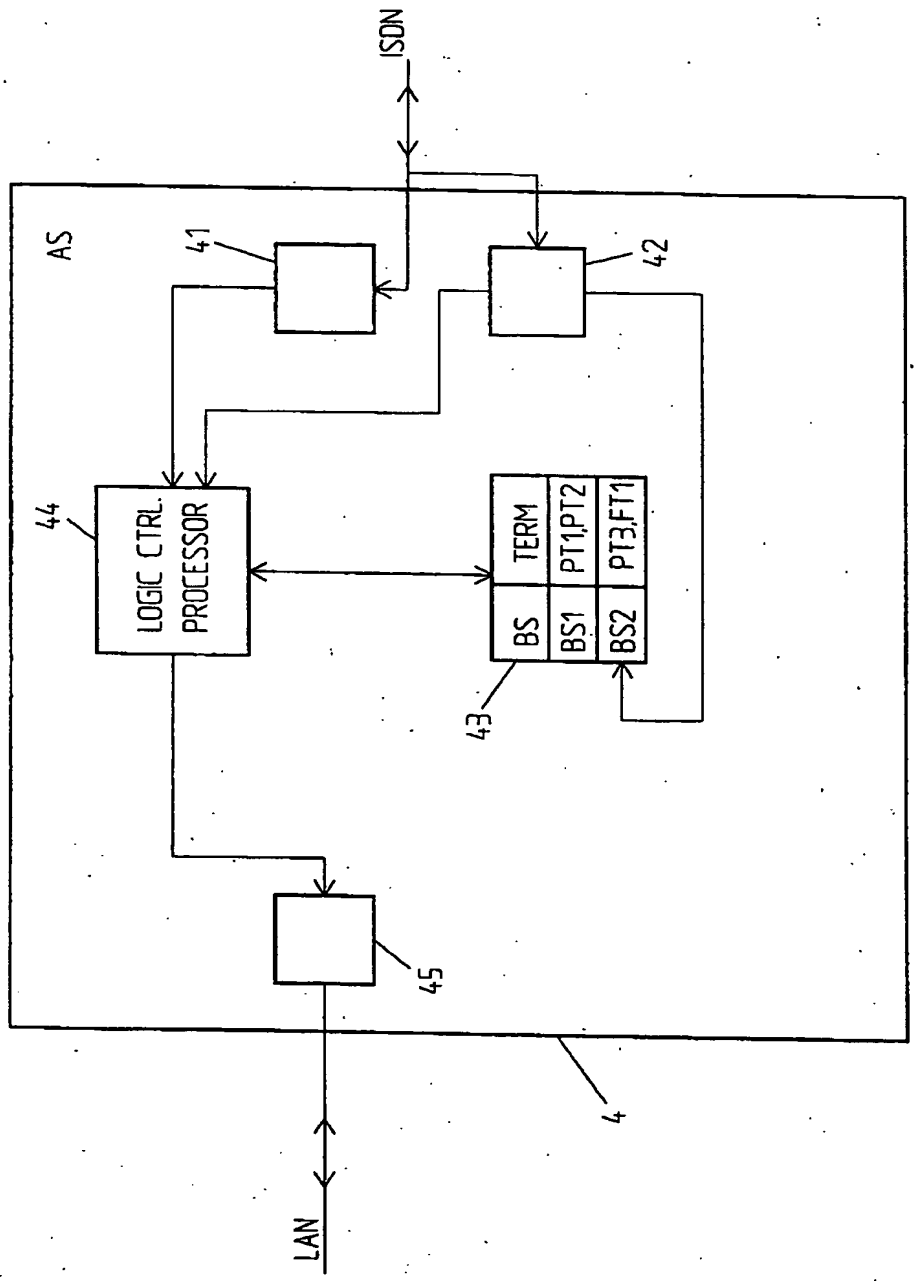

ISDN
AS
41
42
44
LOGIC CTRL.
PROCESSOR
TERM
PT1,PT2
PT3,FT1
BS
BS1
BS2
43
45
4
LAN

FIG.6

FIG. 7

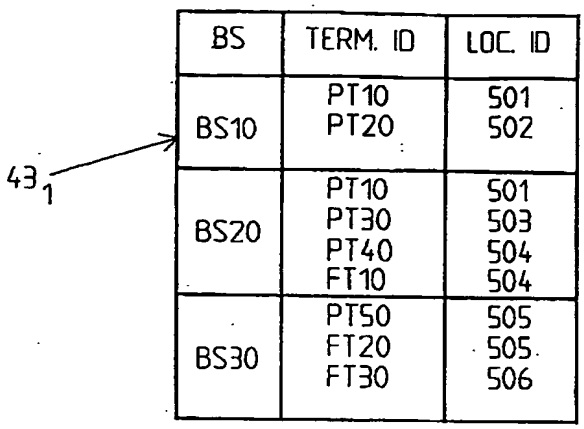
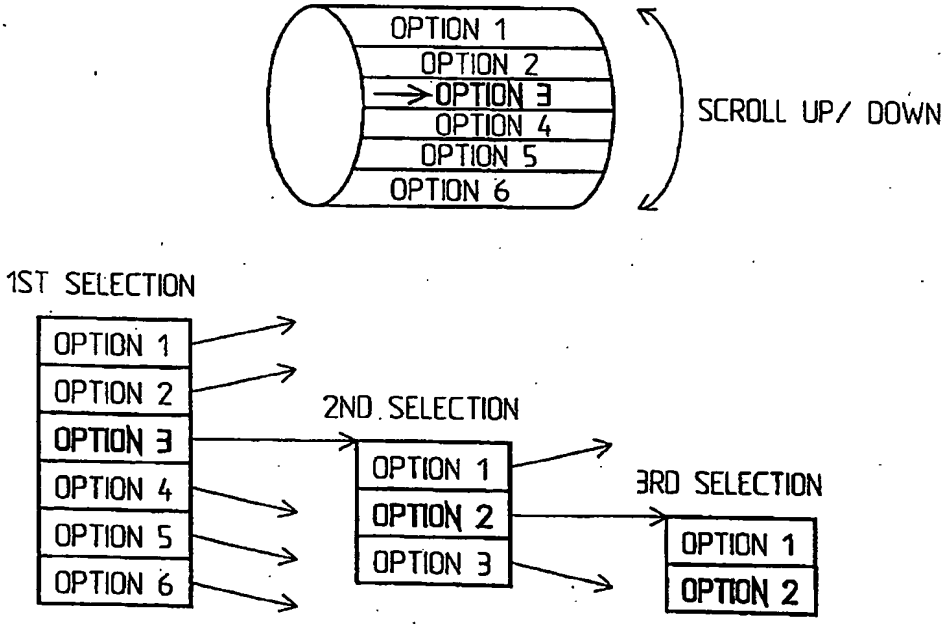

43 1
BS
TERM. ID
LOC. ID
BS10
PT10
PT20
501
502
BS20
PT10
PT30
PT40
FT10
501
503
504
504
BS30
PT50
FT20
FT30
505
505
506

FIG. 8


OPTION 1
OPTION 2
OPTION 3
OPTION 4
OPTION 5
OPTION 6
SCROLL UP/ DOWN
1ST SELECTION
OPTION 1
OPTION 2
OPTION 3
OPTION 4
OPTION 5
OPTION 6
2ND. SELECTION
OPTION 1
OPTION 2
OPTION 3
3RD SELECTION
OPTION 1
OPTION 2

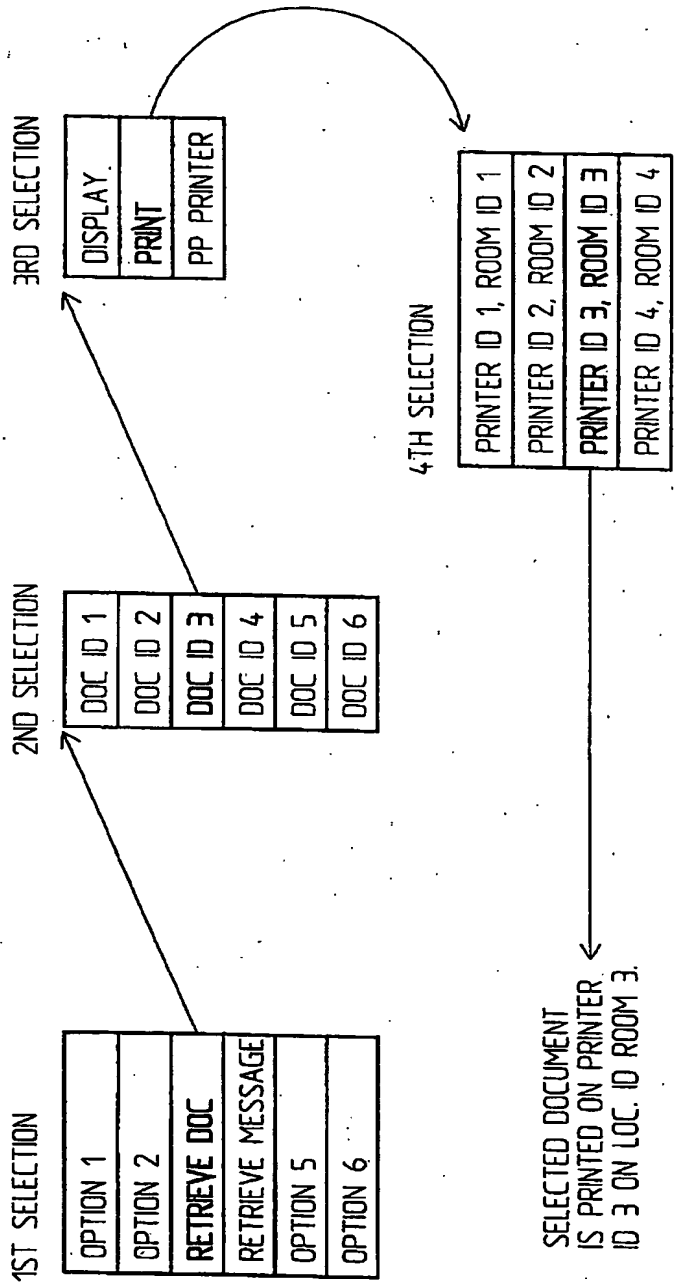

1ST SELECTION
OPTION 1
OPTION 2
RETRIEVE DOC
RETRIEVE MESSAGE
OPTION 5
OPTION 6
2ND SELECTION
DOC ID 1
DOC ID 2
DOC ID 3
DOC ID 4
DOC ID 5
DOC ID 6
3RD SELECTION
DISPLAY
PRINT
PP PRINTER
4TH SELECTION
PRINTER ID 1, ROOM ID 1
PRINTER ID 2, ROOM ID 2
PRINTER ID 3, ROOM ID 3
PRINTER ID 4, ROOM ID 4
SELECTED DOCUMENT
IS PRINTED ON PRINTER
ID 3 ON LOC. ID ROOM 3.

FIG. 9

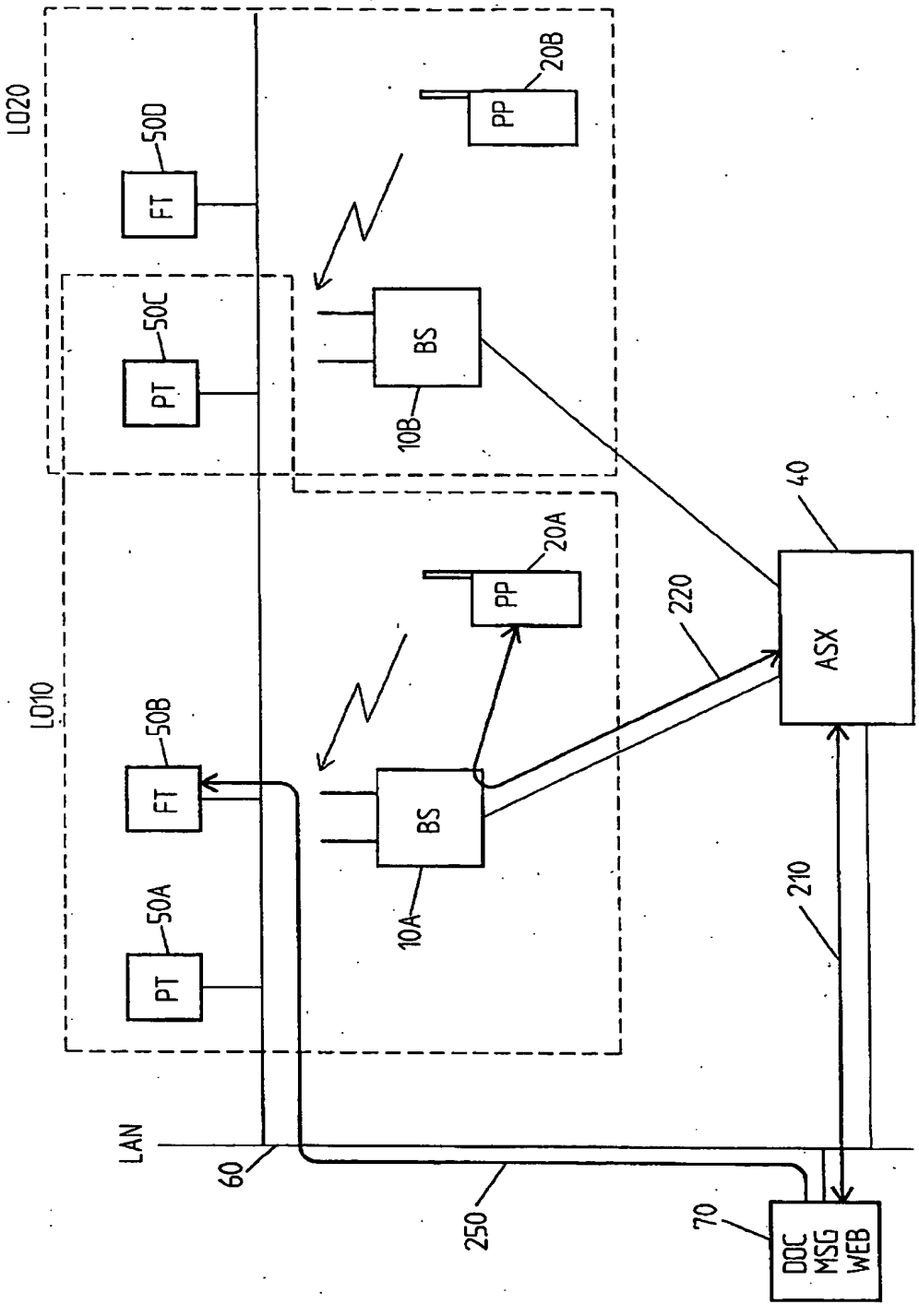

LO20
LO10
PP
20B
FT
50D
PT
50C
BS
10B
PP
20A
FT
50B
PT
50A
BS
10A
40
ASX
220
210
LAN
60
250
70
DOC
MSG
WEB

FIG. 10

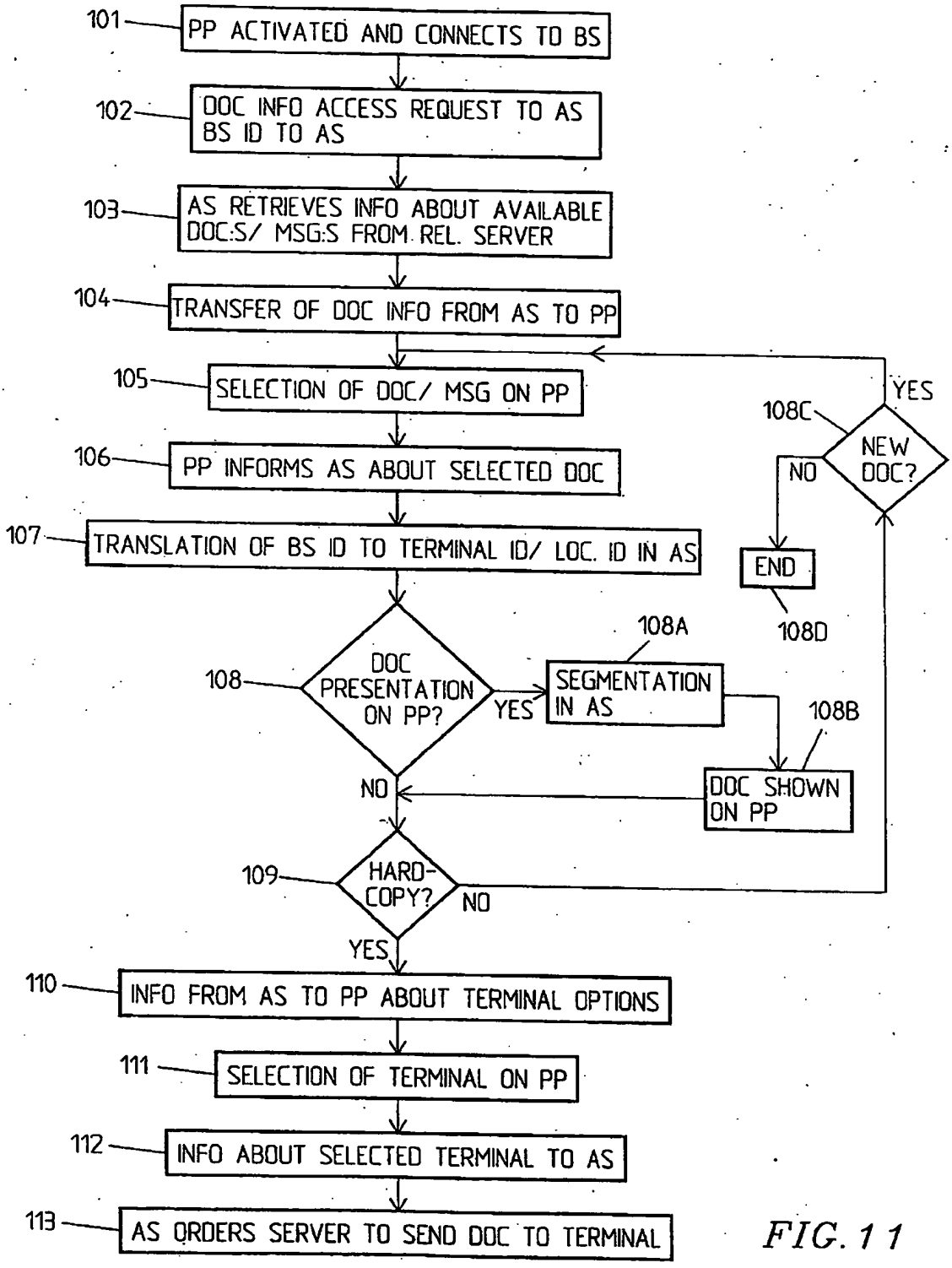

101
PP ACTIVATED AND CONNECTS TO BS
102
DOC INFO ACCESS REQUEST TO AS
BS ID TO AS
103
AS RETRIEVES INFO ABOUT AVAILABLE DOC:S/ MSG:S FROM REL. SERVER
104
TRANSFER OF DOC INFO FROM AS TO PP
105
SELECTION OF DOC/ MSG ON PP
106
PP INFORMS AS ABOUT SELECTED DOC
107
TRANSLATION OF BS ID TO TERMINAL ID/ LOC. ID IN AS
108
DOC PRESENTATION ON PP?
YES
108A
SEGMENTATION IN AS
108B
DOC SHOWN ON PP
NO
109
HARD-COPY?
NO
YES
110
INFO FROM AS TO PP ABOUT TERMINAL OPTIONS
111
SELECTION OF TERMINAL ON PP
112
INFO ABOUT SELECTED TERMINAL TO AS
113
AS ORDERS SERVER TO SEND DOC TO TERMINAL
108C
NEW DOC?
YES
NO
END
108D

FIG. 11